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The use of digital photography to assist in coding of diet diaries in 10-year-old children

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Accurately assessing children's dietary intake is a challenging task because of their limited cognitive abilities and attention spans. Traditionally, surrogate reporters are relied upon to provide information, but as a child become older and more independent this information is likely to be less reliable. Advances in technology, including the use of digital photography and web-based applications, are resulting in new approaches to dietary assessment that may be of particular use in children. To date, digital photography has been used to estimate portion sizes⁽¹⁾ and, in one paediatric study, to provide an objective measure of intake⁽²⁾.

The aims of the present study were to investigate the feasibility and effectiveness of using digital photography as an adjunct to 4 d dietary diaries (two weekdays, two weekend days).

The subjects (n 102), were a subsample of 9–10-year-old children who were part of a larger study, the CHASE study, which is examining the contribution of diet and physical activity to chronic disease in children of ethnic backgrounds. The children's dietary diaries were randomly assigned to one of two groups: (a) to be analysed first with the use of digital photographs, and then without; (b) to be analysed first without and then with photographs. Each diary was analysed on both occasions by the same diet coder and these results compared between the two sets of analysis.

Diaries were analysed and coded using standard procedures at MRC Human Nutrition Research and using the in-house dietary analysis program (Diet In Nutrient Out), which was written in Microsoft Access and is derived from the previous program (Diet In Data Out)⁽³⁾. The in-house food composition database is based on *McCance and Widdowson's The Composition of Foods Sixth Summary Edition*⁽⁴⁾. Each food that could not be coded easily by the description or quantity consumed as provided by the respondent was termed a 'query' food and required further information to resolve. The diet coder recorded the time taken to code each diary with and without photographs. When analysing a diary with photographs, the coder rated compliance with instructions and usefulness in addressing queries by scoring on a scale (1–5) of increasing usefulness.

Of the original 102 diaries, eighteen diaries were rejected as a result of not being adequately completed, leaving eighty-six diaries in the study. Of these diaries, there was a satisfactory completion rate of meals photographed against the number of meals reported: 83.2% for weekdays and 73.6% for the weekend days. A reduced number of queries whilst coding was found: a total of twenty-six without the aid of photographs and thirteen with the aid of photographs. The mean time taken to analyse the diaries (min) was: without photographs (n 39) 36 (SD 21); with photographs (n 45) 23 (SD 12). Diaries with photographs were quicker to analyse.

Photographs were consistently found to assist query answering, food-portion estimation, food identification (ID), as shown from the median rating scales for usefulness:

	Query answering	Food portion	Food ID
With photographs	3	3	3
Without photographs	2	2	2

In conclusion, these preliminary results suggest that digital photographs are feasible to use in dietary assessment in children aged 9–10 years and appear to assist in the coding of food diaries. The use of technology is an important area of study in dietary assessment and may offer a means of addressing some of the challenges in dietary assessment in children.

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2. Martin CK, Robert L, Stephen D *et al.* (2007) *Eat Behav* **8**, 148–156; Epublication 27 April 2006.

3. Price GM, Paul AA, Key FB *et al.* (1995) *J Hum Nutr Diet* **8**, 417–428.

4. Food Standards Agency (2002) *McCance and Widdowson's The Composition of Foods Sixth Summary Edition*. Cambridge: Royal Society of Chemistry.